Do Managers listen to Twitter? Evidence from Mergers & Acquisitions

Christoph M. Schiller*

April 2019

Abstract

This paper examines if corporate investment decisions are sensitive to social media feedback, and if social media can affect the efficiency of corporate capital allocation. Using machine learning techniques to capture the reaction of millions of StockTwits and Twitter users to the announcement of corporate acquisitions, I show that social media feedback to M&A announcements predicts the subsequent completion or withdrawal of the acquisition attempt. The effect persists controlling for stock market reaction and traditional news media coverage, is more pronounced when more prominent users are tweeting about the acquisition, and increases when stock price informativeness is low. This approach will further allow me to study the relation between social media feedback and long-term M&A performance.

1 Introduction

Firms and managers increasingly use social media to communicate with the market and disseminate information. Since the SEC officially permitted the use of social media for announcing key information in compliance with Regulation-FD in 2013[1], firms have frequently relied on social media as a channel to strategically disclose information (Jung, Naughton, Tahoun, and Wang, 2017) and manage investor relations (Blankespoor, Miller, and White, 2014; Elliott, Grant, and Hodge, 2018). While the literature has extensively studied how firms use social media platforms to address customers and financial markets, research has been silent on the reverse direction: the influence of social media on firms and managers. In contrast, anecdotal evidence suggests that companies closely monitor social media postings and sentiment (Bartov, Faurel, and Mohanram, 2018) to gather user feedback and guide corporate decisions (Zhang, Kang, Jiang, and Pei, 2018). In fact, 'Social Media Monitoring' (SMM) has emerged as a new industry with companies such as Hootsuite, TweetReach, If This Then That (IFTTT), and Brandwatch Analytics now offering continuous monitoring and analysis of online content to help inform managers.

This raises several important questions. Are firms' investment and capital allocation decisions sensitive to social media feedback? How important are non-traditional media relative to traditional news media and other information intermediaries? And, does social media feedback improve or distort the efficiency of capital allocation decisions? To address these questions, this paper studies how user reactions and feedback in a financial social media network affect firm investment decisions, focusing on one type of corporate investment in particular: mergers & acquisitions.

M&As are among the largest investments firms make (Loughran and Vijh, 1997; Rau and Vermaelen, 1998), and provide an ideal setting to study corporate investment decisions. If managers consider all information available to them when announcing an acquisition attempt, the sensitivity of deal completion to outside feedback to the announcement can be interpreted as 'management learning'. Based on this

*Rotman School of Management, University of Toronto. Email: cschiller@rotman.utoronto.ca.

[1]See: https://www.sec.gov/news/press-release/2013-2013-51htm.

idea, previous research has shown that stock market announcement returns inform corporate decisions, including M&As (Luo, 2005), SEOs (Giammarino, Heinkel, Hollifield, and Li, 2004), and management earnings forecasts (Zuo, 2016), as financial markets incorporate the information of millions of investors (Bond, Edmans, and Goldstein, 2012). However, stock prices are subject to trading frenzies (Goldstein, Ozdenoren, and Yuan, 2013), can be manipulated (Goldstein and Guembel, 2008), and are often plagued with noise, leading to misinterpretation by managers (Dessaint, Foucault, Frésard, and Matray, 2018). In contrast, short tweets by investors and market observers on social media, verbalizing the 'wisdom of the crowd', might be easier to interpret by managers and hence affect their beliefs and decision making.

2 Data & Methodology

I combine over 35 million time-stamped messages from the social media investing platform 'StockTwits' with a comprehensive sample of U.S. M&As from 2010 to 2014. StockTwits is similar to Twitter in that it allows users to share short messages (i.e. 'tweets') of up to 140 characters with their followers. Unlike Twitter, StockTwits is specifically geared towards the discussion of financial markets and individual stocks. The use of so-called 'cashtags', a dollar sign plus a ticker symbol, allows for the precise association of a given tweet with the corresponding firm. By 2014 StockTwits had over 1.3 million unique views per month, many of them professional traders and investors (Cookson and Niessner, 2019), generating approximately 1.5 million tweets per month. Since 2011 StockTwits tweets have been integrated in online platforms such as S&P Capital IQ, Yahoo! Finance, CNN Money, and Reuters.

Using machine learning techniques to generate firm-specific, daily investor sentiment for each firm, I measure the social media reaction to an acquisition announcement as the abnormal acquirer sentiment in the days around the M&A announcement. I rely on the fact that StockTwits users can attach a 'bullish' or 'bearish' tag to each tweet. This provides me with a training sample of millions of user-classified posts to implement a Maximum Entropy (ME) classification algorithm, as ME controls for the conditional dependence of words and does not suffer the noise introduced by keyword selection. Given the enormous size of the data, I remotely execute Python scripts on Amazon Web Services (AWS) cloud servers.

3 Preliminary Results

Consistent with the idea that managers are sensitive to social media feedback, I find that abnormal acquirer-firm sentiment following an M&A announcement significantly predicts the subsequent withdrawal of announced acquisition. A change in social media reaction from positive (top quartile of abnormal sentiment) to negative (bottom quartile) is associated with a decrease of 3 percentage points in the likelihood of M&A completion (significant at the 1%-level). Given the unconditional sample average that a deal is withdrawn of 9%, this effect is economically meaningful. It persists after controlling for the announcement returns of the acquirer and target firm, a host of deal and firm characteristics, as well as time- and industry trends. The estimates are unaffected by the inclusion of newspaper tone and coverage (as in Liu and McConnell, 2013), suggesting that traditional news media are not driving my results. Further, I find a stronger effect when stock price informativeness is low, consistent with the idea that managers use social media as a substitute for stock market feedback when stock prices contain less

private information or more noisy. This approach will also allow me to study the relationship between social media reaction and long-run M&A performance, to examine if the feedback from social media helps improve managers' investment decisions and firms' capital allocation.

4 Prospective Contribution

This paper will contribute to the growing literature on FinTech (Philippon, 2016) in several ways: First, this is the first paper to examine the role of non-traditional media for corporate investment decisions. The preliminary results are consistent with recent research showing that investors use FinTechs as a substitute for traditional information sources (Grennan and Michaely, 2018). In contrast to Jiao, Veiga, and Walther (2018), I document that social media are not simply an echo-chamber for news media but contain a distinct signal, consistent with Azar and Lo (2016), that affects managers' investment decisions.

Second, I contribute to the literature on social media as a communication device for firms. By examining the feedback from social media reactions to corporate M&A deals I show that social media act as a channel for the transmission of signals in both directions: from firms to the market, and from the market to firms.

Third, this paper adds to the literature on FinTech and price informativeness. In line with the idea that prices should become more informative as information acquisition becomes cheaper (Grossman and Stiglitz, 1980; Verrecchia, 1982), Bai, Philippon, and Savov (2016) document that price informativeness has increased for large firms over the last decades. In contrast, Dugast and Foucault (2018) argue that a decline in the cost of raw, low-quality data can have a negative effect on price informativeness if it reduces the demand for processed high-quality data, and Farboodi, Matray, and Veldkamp (2018) document a decrease in price informativeness for smaller firms. This paper provides a new perspective on this line of research by documenting that in addition to the indirect effect of FinTechs on firms through price informativeness, firms are directly affected by FinTechs and non-traditional media.

References

Azar, P. D. and A. W. Lo (2016). The wisdom of Twitter crowds: Predicting stock market reactions to FOMC meetings via Twitter feeds. *The Journal of Portfolio Management 42*(5), 123–134.

Bai, J., T. Philippon, and A. Savov (2016). Have financial markets become more informative? *Journal of Financial Economics 122*(3), 625–654.

Bartov, E., L. Faurel, and P. S. Mohanram (2018). Can Twitter help predict firm-level earnings and stock returns? *The Accounting Review 93*(3), 25–57.

Blankespoor, E., G. S. Miller, and H. D. White (2014). The role of dissemination in market liquidity: Evidence from firms' use of Twitter. *The Accounting Review 89*(1), 79–112.

Bond, P., A. Edmans, and I. Goldstein (2012). The real effects of financial markets. *Annual Review of Financial Economics 4*(1), 339–360.

Cookson, J. A. and M. Niessner (2019). Why don't we agree? Evidence from a social network of investors. *The Journal of Finance*, Forthcoming.

Dessaint, O., T. Foucault, L. Frésard, and A. Matray (2018). Noisy Stock Prices and Corporate Investment. *The Review of Financial Studies*, Forthcoming.

Dugast, J. and T. Foucault (2018). Data abundance and asset price informativeness. *Journal of Financial Economics 130*(2), 367–391.

Elliott, W. B., S. M. Grant, and F. D. Hodge (2018). Negative news and investor trust: The role of $firm and# CEO twitter use. *Journal of Accounting Research 56*(5), 1483–1519.

Farboodi, M., A. Matray, and L. Veldkamp (2018). Where has all the big data gone? Working Paper, Available at SSRN 3164360.

Giammarino, R., R. Heinkel, B. Hollifield, and K. Li (2004). Corporate decisions, information and prices: do managers move prices or do prices move managers? *Economic Notes 33*(1), 83–110.

Goldstein, I. and A. Guembel (2008). Manipulation and the Allocational Role of Prices. *The Review of Economic Studies 75*(1), 133–164.

Goldstein, I., E. Ozdenoren, and K. Yuan (2013). Trading frenzies and their impact on real investment. *Journal of Financial Economics 109*(2), 566 – 582.

Grennan, J. and R. Michaely (2018). Fintechs and the market for financial analysis. Working Paper, SSRN 3136150.

Grossman, S. J. and J. E. Stiglitz (1980). On the impossibility of informationally efficient markets. *The American Economic Review 70*(3), 393–408.

Jiao, P., A. Veiga, and A. Walther (2018). Social media, news media and the stock market. Working Paper, Available at SSRN 2755933.

Jung, M. J., J. P. Naughton, A. Tahoun, and C. Wang (2017). Do firms strategically disseminate? Evidence from corporate use of social media. *The Accounting Review 93*(4), 225–252.

Liu, B. and J. J. McConnell (2013). The role of the media in corporate governance: Do the media influence managers' capital allocation decisions? *Journal of Financial Economics 110*(1), 1 – 17.

Loughran, T. and A. M. Vijh (1997). Do long-term shareholders benefit from corporate acquisitions? *The Journal of Finance 52*(5), 1765–1790.

Luo, Y. (2005). Do insiders learn from outsiders? Evidence from mergers and acquisitions. *The Journal of Finance 60*(4), 1951–1982.

Philippon, T. (2016). The fintech opportunity. NBER Working Paper.

Rau, P. R. and T. Vermaelen (1998). Glamour, value and the post-acquisition performance of acquiring firms. *Journal of Financial Economics 49*(2), 223 – 253.

Verrecchia, R. E. (1982). Information acquisition in a noisy rational expectations economy. *Econometrica 50*(6), 1415–1430.

Zhang, W., L. Kang, Q. Jiang, and L. Pei (2018). From buzz to bucks: The impact of social media opinions on the locus of innovation. *Electronic Commerce Research and Applications 30*, 125 – 137.

Zuo, L. (2016). The informational feedback effect of stock prices on management forecasts. *Journal of Accounting and Economics 61*(2), 391 – 413.